Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of Part 90 of the Commission's Rules	)	WP Docket No. 07-100

COMMENTS OF THE SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT ON THE SIXTH FURTHER NOTICE OF PROPOSED RULEMAKING

PHYLLIS A. WHITTEN
Attorney
Office of the General Counsel
San Francisco Bay Area Rapid Transit District
300 Lakeside Drive, 23rd Floor
Oakland, CA 94612

TABLE OF CONTENTS

SUMMARY

The San Francisco Bay Area Rapid Transit District ("BART"), a 4.9 GHz licensee, currently uses 4.9 GHz frequencies for public safety purposes and plans to implement a Communications Based Train Control ("CBTC") system (currently in the procurement process) throughout its geographic licensed area. BART supports the FCC's plan to "grandfather" existing licenses and wants to retain authority to implement its CBTC system.

BART is currently transitioning and upgrading its over 40 year old system with 1,081 modern "Fleet of the Future" train cars, including modernizing its train control system to a CBTC system. BART supports Commission efforts to ensure that public safety continues to be a top priority for the 4.9 GHz band. BART needs protection from harmful interference, and does not support licensing any "co-primary" or secondary users in its operational area, or within two (2) miles of its operations. BART seeks full and flexible use of band aggregation plans. BART suggests it be assigned a specific geographic footprint for its public safety train control uses. BART's $5 billion plan to modernize its rail fleet and operate the CBTC system will require a large number of fixed sites. BART opposes the proposed 12 month construction deadline and suggests that the 18 months be retained, extending time on a case by case basis. A current user's status should not become secondary if it cannot meet the deadline. BART will need longer than 12 months to conduct design review and construct its CBTC system.

BART does not support waiving frequency coordination requirements for other users, especially short-term users, within two miles of BART's zone of operations. The Commission should require notice and consent for proposed "co-primary" or secondary users. BART opposes granting authority to any secondary or co-primary user in its two-mile operations zone, and to any users that may cause actual or potential interference. BART also strongly opposes temporary uses of the 4.9 GHz frequencies within the two mile zone. BART's use of frequencies is essential,

continuous and conducted during all hours of operation and maintenance. BART supports a maximum EIRP, to include a maximum EIRP limit for all directional links, with good planning and propagation to prevent power-related and interference issues.

BART is an active participant in the regional planning process. BART needs to review and approve any proposed new uses within its geographic license zone. BART supports the Commission's promotion of either mandatory or voluntary technical standards for equipment, with standards that promote inter-operability and flexibility, and that promote innovative and cost-effective equipment for use by public safety entities. The 30-day process suggested by the Commission for a public safety entity to file an application for the same channels sought by another entity is not acceptable. It does not give public safety entities sufficient time to prepare and file an application. BART suggests the Commission lengthen the 30-day time frame to a minimum of 90 days. BART proposes that it be allowed to retain geographic eligibility in its operational zone by filing notice with the Commission in advance of the application process. BART opposes extending eligibility to commercial entities, and supports "sharing" where an agreement is in place with a public safety entity for a public safety purpose. BART opposes any sort of mandatory "sharing" unless it is determined that there is no interference with BART operations and public safety uses. BART does not support eligibility being granted to commercial users on a secondary or non-interference basis without clear notice and agreement of public safety entities in the geographic area. BART opposes re-designating the 4.9 GHz band, in whole or in part, to support commercial wireless use in the San Francisco Bay Area. The record in this proceeding is inadequate to support a wholesale re-designation of public safety spectrum to commercial use. BART supports continued priority to public safety and related uses.

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of Part 90 of the Commission's Rules	)	WP Docket No. 07-100

To: The Commission

COMMENTS OF THE SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT ON THE SIXTH FURTHER NOTICE OF PROPOSED RULEMAKING

The San Francisco Bay Area Rapid Transit District ("BART" or "the District"), a rapid transit district established pursuant to the California Public Utilities Code, hereby submits its Comments in the above-captioned matter. BART provides public transit services to passengers in five counties within the San Francisco Bay Area. The BART Police Department provides policing and other public safety services to BART's passengers.

I. BART, a 4.9 GHz Licensee, Supports Grandfathering

BART is a current 4.9 GHz geographical licensee. BART's current geographic license area is a 60 kilometer radius around the Lake Merritt (Oakland, California) BART Station (37 47 51.7 N, 122 16 02.9 W), shown in the map attached as Exhibit A-1. BART uses the frequencies for a variety of public safety purposes.

BART currently uses 4.9 GHz frequencies for transmitting public safety video images captured from cameras installed within train cars and stations in the BART system, and plans additional public safety use of the 4.9 GHz frequencies, both for cameras, data and train control purposes, as described below.

As a current and future user of the licensed public safety 4.9 GHz frequencies, BART supports the FCC's plan to "grandfather" existing licenses and uses, particularly BART's geographic license and its current and planned public safety uses within its geographic licensed area. Recently, voters within the three northern California counties in the BART District approved revenue bonds for modernizing, updating, upgrading and expanding the BART system. Some of the planned upgrades include a more modern communications based train control system that may use 4.9 GHz frequencies.

As BART's Comments demonstrate, its current and future proposed uses of the 4.9 GHz frequencies are in the public interest. The Commission's rules should continue to support vital public safety uses and prevent harmful interference within areas of public safety use. BART attaches Exhibit A-2 to show its minimum critical future operational network area. This zone is the interference protection area that BART will need to provide its vital public safety services.

II. BART Uses of 4.9 GHz Are for Public Safety Purposes

BART is a public entity, a rapid transit district, governed by a publicly elected Board of Directors. BART has its own dedicated police force, the BART Police Department, consisting of approximately 224 sworn officers. BART operates its own public safety communications and video camera system on BART trains monitored by BART Police. The system transmits video data wirelessly via the 4.9 GHz frequencies to protect passengers, assess real time threats and record incidents that may occur in critical areas of operation.

BART operates an efficient, reliable transit system for commuters, families, friends and tourists to safely reach their destinations in the San Francisco Bay Area. BART operates 48 stations, including 19 surface stations, 14 elevated and 15 subway stations in the 121 mile electrically powered heavy rail public transit system. The system includes approximately 32 miles

of aerial track. During fiscal year 2018 BART estimates 126 million trips were completed by passengers annually, serving residents and visitors throughout the San Francisco Bay Area.

III. Communications Based Train Control for BART's Fleet of the Future

BART currently is in the process of transitioning its over forty year old 669 car fleet to 1081 new "Fleet of the Future" train cars. Testing of the first delivery of train cars has been conducted and the new trains cars are gradually entering revenue service this year. Additional cars will be delivered over the next 5 years. The new trains represent nearly a $2 billion investment of federal, state and local funds. As part of current and planned service improvements, BART is now in the midst of a procurement process for a new communications based train control ("CBTC") system, a project budgeted at an estimated cost of 1-2 billion dollars to design, procure, install, commission, test and cut-over in a phased approach throughout the entire BART District. BART plans to make available its licensed 4.9 GHz frequencies for public safety cameras, train to ground communication and the vital new CBTC train control system. The CBTC system, once designed, procured and built, will be the instrumental factor in increasing passenger and train critical capacity, reliability and safety needs as BART deploys its Fleet of the Future. A modern, state-of-the-art train control system will allow BART to safely operate more frequent service on its existing routes. In addition, a modern train control system will give BART the technical ability to route trains through key interlockings (areas of potential conflicting train movement) throughout all areas of BART operations.

In addition, BART is expanding services to new areas in the greater San Francisco Bay Area, including Silicon Valley, and will need improved train control, state-of-the-art communications and other public safety services to achieve on-time and efficient operations in these planned expanded service areas. BART also will be able to offer better links to other regional rail, light rail and other transportation systems, such as Capital Corridor Joint Powers Authority

(train service to Sacramento managed by BART), the San Francisco Municipal Transportation Authority ("SFMTA"), the Santa Clara Valley Transportation Authority ("VTA") serving Silicon Valley), the San Mateo County Transit Authority ("SamTrans"), AC Transit in Alameda and Contra Costa Counties, and Golden Gate Transit, offering ferry and bus services in Marin and Sonoma Counties connecting to San Francisco and other regional connections.

The planned CBTC system will consist of hardware, software and use of wireless services. The CBTC system will be fully reliant upon the physical layer wireless network services between train and ground communication systems, and will be used to ensure the safe operation of the BART system, both for passengers and the safety of the public generally. The system will control and monitor train movements, transitioning through switches, ensuring safe distance and separation between trains, managing train locations, and helping BART staff to analyze, manage and re-prioritize services around any emergencies or incidents and report on any issues. The CBTC system will increase the capacity and reliability of the BART transit system, decrease the runtime of trains between stations, diminish delays and late arrivals and allow trains to run closer together. BART's existing system is a track circuit-based system that separates trains by fixed track segments. The sizes of the fixed segments are determined for the worst-case scenarios. A new CBTC system will use real-time train location data, including speed, to safely determine and optimize the physical separation of trains. Modernizing BART's train control system to a CBTC system will allow trains to operate at more closely spaced intervals and at faster speeds through critical network bottleneck locations, thereby increasing BART's capacity to carry more passengers and improve on-time performance of the BART system. A modernized train control system will enable BART to meet projected demand of over 30,000 passengers per hour in the peak commute time periods, compared to today's maximum of approximately 21,000 riders.

IV. BART Needs Protection from Harmful Interference

BART supports the Commission's announced goal to adopt rules that will ensure that public safety users continue to have priority in the 4.9 GHz band, and also supports efforts to prevent harmful interference to vital public safety uses of the spectrum. BART emphasizes that it will need protection from harmful interference to its planned CBTC and other public safety uses of the 4.9 GHz radiofrequency use areas (within two miles of the BART network, as shown on the map in Exhibit A-2). BART also will need protection from harmful interference by secondary users. BART does not support licensing any "co-primary" or secondary users in its operational area, or within two miles of BART's operations. Of course, BART also objects to any authorization, on any basis, be it temporary or ongoing, to any users that may cause interference to any BART train operations or passenger and public safety use.

Given the nature of the BART's system infrastructure, a variety of factors will need to be considered in interference protection. BART's transit system consists of trackway at several grades, including aerial structures, at grade rail operations and tunnels with underground entrances and various other openings, such as vent structures and emergency egress locations where radiofrequency ("RF") could enter and cause potential interference. Other adjacent spectrum users located within and adjacent to the BART District will need careful management. BART, working with the regional public safety planning process will need to have approval and concurrence of any proposed uses of the spectrum from any prospective adjacent users or those prospective users around BART's rail rights-of-way that might cause interference to BART operations, including but not limited to rail operations, passenger and station public safety within and adjacent to the District.

V. The Band Plan Should Be Flexible

BART seeks to have the full and flexible ability to use band aggregation plans ranging from 40, 30, 20, 15, 10, 5 and 1 MHz. Such flexibility in the bands plans will allow better bandwidth planning, use of the most optimal frequencies for the needed public safety uses, and to minimize adjacent channel and co-channel interference issues. BART's train control design concept has fixed radio bases spaced 500 to 800 feet apart. BART may not use Channels 1-5, and may not object to such uses by others, as long as such uses are coordinated, and do not cause adjacent channel or other interference with BART public safety uses of the 4.9 GHz frequencies.

BART agrees that there should not be any requirement for repurposing, relocating or reconfiguring existing uses and users. Such changes could cause harm and disruption to existing public safety use by BART, especially if it were required to change equipment and systems on up to over 1,700 cars (both old and new cars in the BART fleet), and at the wayside (beside the tracks) base radio stations. BART would like to certify all the channels currently in use by BART, and the channels to be used in the communications based train control project BART plans to implement soon, following the current procurement process. BART's plans have been developed in reliance on the current geographic licensing scheme. BART seeks protection, on a geographic basis, for all the specified channels and uses, without actual or potential interference, within two miles of its operational area.

VI. No Waiver of Frequency Coordination for New Users

BART supports the NPRM's proposal that an existing user should not be required to frequency coordinate for current uses, but given the current and proposed uses of 4.9GHz frequencies that BART needs for its operations, BART suggests that it be assigned a specific geographic footprint for its public safety train control uses, so that other potential users will be on notice that BART has actual and planned critical public safety uses throughout its operating area.

BART's planned CBTC system will require hundreds of fixed sites with a significant $2 billion investment in design, equipment, installation and related work. Therefore, BART may need to work with the Commission to figure out an efficient process for filing in the ULS database the large volume of fixed sites BART will require for its public safety train control uses. In addition, the year time limit to complete this filing process should be extended to 18 months or longer. Many public safety users may be limited by timeframes for grant application and funding, public procurement processes, for construction and other issues, such as resource constrained public employees. Public entities may need additional time to prepare and file the requested information, especially if there is a very large volume of fixed sites, with the applications requiring details such as propagation studies for each application. In addition, there may be the need to review the submissions of other users to make sure that there will be no conflicts of use or actual or potential harmful interference.

Given that BART uses the 4.9 GHz frequencies for critical public safety uses, BART does not support waiver of frequency coordination requirements for any other users, even and especially short term uses, if such uses are proposed to operate at or near (within two miles) of BART's zone of operations. Certainly the Commission should require notice of, and consent by, existing users for any proposed secondary or co-primary uses. BART opposes grant of authority to any secondary or co-primary user in its service territory (the two mile zone surrounding BART's transit system), and to any uses or users that may cause actual or potential interference to BART systems and the public safety generally in the San Francisco Bay Area.

VII. ULS Database Practical and Procedural Issues

BART's planned CBTC System will require hundreds of fixed sites, and BART may need to work with the Commission to figure out an efficient process for filing in the ULS database the large volume of fixed sites BART will require for its public safety train control uses. In addition, the one year time limit to complete this filing process should be extended to 18 months or longer. Many public safety users may be resource constrained public employees, subject to public procurement contract processes and grant funding timing and thus may need additional time to prepare and file the requested information, especially if there is a large volume of sites.

BART agrees that it is not appropriate to charge public safety entities a fee for ULS filings, and supports the Commission's decision to not require frequency coordination for current uses. BART does not agree that a current user's status should become secondary if it cannot meet the one year filing deadline—a simple waiver process may be more accommodating to public safety users and public entities like BART. The secondary status proposal is unduly punitive to public safety entities.

For future filings, accurate propagation models of coverage will be very important, especially for directional point to point or multipoint sites. The Commission should require licensing and frequency coordination for all temporary/short term uses—proper procedures and authorization are critical components to assure that existing public safety uses do not receive unnecessary and potentially dangerous harmful interference.

VIII. BART Supports a Regional Planning Process

BART supports regional planning. BART currently is an active participant in the regional licensing process and participates on several radiofrequency licensing committees. BART plans to continue its active participation in the regional planning process, and will work with other public safety licensees in its region to develop an updated regional plan. BART needs to be able to review

and approve any proposed new uses within its license zone, especially any proposed use of the 4.9 GHz frequencies.

IX. Technical Standards May Need Additional Notice and Comment

If the Commission determines that either mandatory or voluntary national or international technical standards (perhaps similar to Wi-Fi IEEE 802.11 standards) are appropriate for 4.9 GHz equipment, BART supports standards that promote interoperability and flexibility, while promoting innovative and cost-effective equipment for use by public safety entities. BART suggests that the Commission provide notice and seek further comments if it does determine to adopt standards, both to develop a complete record in this matter and to allow current and prospective users an opportunity to review and comment on any new proposals.

X. No Temporary and Secondary Uses of Point to Point and Point to Multipoint

BART opposes temporary and secondary uses of the 4.9 GHz frequencies within two miles of its geographic zone of operations, or any uses that would cause interference to BART systems and public safety, even if the secondary and temporary users accept the risk of interference and agree to cease operation if such operations cause interference with BART as primary user. Because BART needs to use the frequencies for mission- critical train control and other related public safety operations, no amount of interference is acceptable. BART needs to control and prevent even potential interference that may cause train and public safety operational issues, rather than rely upon an after the fact agreement for an interfering user to cease operations if interference occurs. The harm already may have happened in the after the fact scenario. BART's use is essential, continuous and will be during all its hours of operation and maintenance, throughout its service area, 24 hours a day (maintenance is occurring even when the trains are not operating), throughout the year, days, nights, weekends, and even most holidays.

XI. Maximum Power Limits Should Be Adopted by the Commission

BART supports a maximum effective isotropic radiated power ("EIRP") limit. The FCC should include a maximum EIRP limit for all directional links. Good propagation and planning analysis should be essential to prevent power-related service and interference issues.

XII. Polarization Issues for Regional Planning Process

BART will discuss polarization issues in the regional planning process, but does not anticipate that polarization schemes will be of much benefit in the San Francisco Bay Area due to the local topography, extent of San Francisco Bay water adjacent to most of the cities and counties in BART area of operations, and urban buildings, especially high rise zones of the major cities within the area BART serves.

XIII. Deployment Reports, Construction Deadlines

BART understands that the Commission seeks to promote use of the 4.9 GHz frequencies by shortening the current 18 month construction deadline to one year, and proposes to require all 4.9 GHz licensees to place at least one base or temporary fixed station in operation within 12 months of license grant. BART will need to construct a very large volume of fixed radio base stations for its over $5 billion public bond funded modernization of its rail fleet and associated communications based train control systems. BART will need longer than one year to conduct design review and construct the CBTC system—a more realistic time frame for BART, given procurement cycles for public entity projects in California and the required construction throughout 140 miles of current and planned service areas, would be 10 years, with additional years needed for future extensions that will require more than two decades for planning, concept, funding and construction. If the Commission grants extensions of time and waivers of the one year deadline in specific cases of demonstrated need, that may be one approach to large and complex projects such as the public safety projects BART is working on. However, strict

application of the one year period may prove to be an impediment to large and worthy public safety projects and the Commission should consider leaving the construction deadline at 18 months and extending time in cases of demonstrated need. Another approach that BART advocates is designating a specific geographic area to BART for its public safety operations.

XIV. Eligibility, Shared Use and Other Alternatives

BART opposes opening its service territory to secondary, co-primary or shared uses because BART is concerned that such uses would interfere with its planned public safety uses, including its plans for a system-wide communications based train control system.

The proposal to allow public safety licensing priority for at least three years is a good one, but, as noted above, BART's position is that planned public safety uses of the spectrum should be protected much longer, especially for complex projects. The proposed "notice" process by the Commission (allowing a public safety entity only 30 days to file an application for the same channels sought by another entity) is not acceptable—it may not give public safety entities sufficient time to prepare and file an application or applications, especially if the notice is not routed appropriately within an organization, resulting in less than the already limited 30 day period to pull together and file the information required. As noted previously, public entities are subject to public procurement processes, Board approvals, and other governmental processes that may preclude a 30 day process. The Commission should consider lengthening the 30 day time frame to a minimum of 90 days.

BART proposes, as an existing 4.9 GHz licensee with plans to use the 4.9 GHz frequencies on a geographic basis throughout its service territory in the San Francisco Bay Area, implementing services through the next decade to provide new and enhanced public safety services and that public safety entities be allowed to retain specified geographic eligibility by filing notice with the Commission in advance of the application process. In any event, current public safety entities

should be given more than 30 days, and BART suggests at least 90 days, to prepare and file applications for use of the 4.9 GHz frequencies within the three year period.

BART opposes extension of eligibility to commercial entities and only supports "sharing" when there is an agreement in place with a public safety entity and the use is for a public safety purpose. BART opposes any sort of mandatory "sharing" and needs to protect its public safety uses in its geographic area of operations.

XV. BART Does Not Support Leasing If Interference is Caused

BART does not support leasing unless it is determined that the leased spectrum does not interfere with BART operations and public safety uses.

XVI. Two-Tiered Sharing on a Secondary Basis

BART does not support opening eligibility to commercial users on a secondary or non-interfering basis without the clear notice and agreement of public safety entities in the geographic area and all existing users. BART agrees with commenters who previously have expressed concern about the timing difference for implementing communications projects between commercial and public safety entities. Public safety entities generally require greater lead time than commercial entities both to secure funding and to construct systems in a dynamic operating environment. This timing difference could create additional pressure by commercial entities, and if the rules do not protect public safety entities, an expedited process could limit or foreclose public safety use and greatly increase the risk of interference, congestion and other operational issues that are not in the public interest.

XVII. Other Alternatives

BART opposes re-designating the 4.9 GHz band, in whole or in part, to support commercial wireless use in the San Francisco Bay Area. Not only should current public safety uses be "grandfathered," but also all active public safety plans for geographic use of the spectrum should

be recognized, planned for and protected. The record in this proceeding is inadequate to support a wholesale re-designation of public safety spectrum for commercial use.

XVIII. Conclusion

BART, a current 4.9 GHz licensee, strongly advocates that the Commission grandfather both existing and planned public safety uses of the 4.9 GHz spectrum, and adopt policies and rules that will adequately protect public safety users from harmful interference. The Commission should continue to rely on the regional planning process, and should work with licensees to streamline ULS filing process and give public entities sufficient time to make required filings.

BART supports continued priority in the 4.9 GHz frequency band to public safety entities and respectfully requests that the Commission adopt rules and policies that protect both current and planned uses of 4.9 GHz frequency band.

Respectfully submitted,

SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT, a rapid transit district established pursuant to California Public Utilities Code section 28500, et seq.

By: 

Phyllis A. Whitten, Attorney
Office of the General Counsel
San Francisco Bay Area Rapid Transit District
300 Lakeside Drive, 23rd Floor
Oakland, CA 94612

July 6, 2018

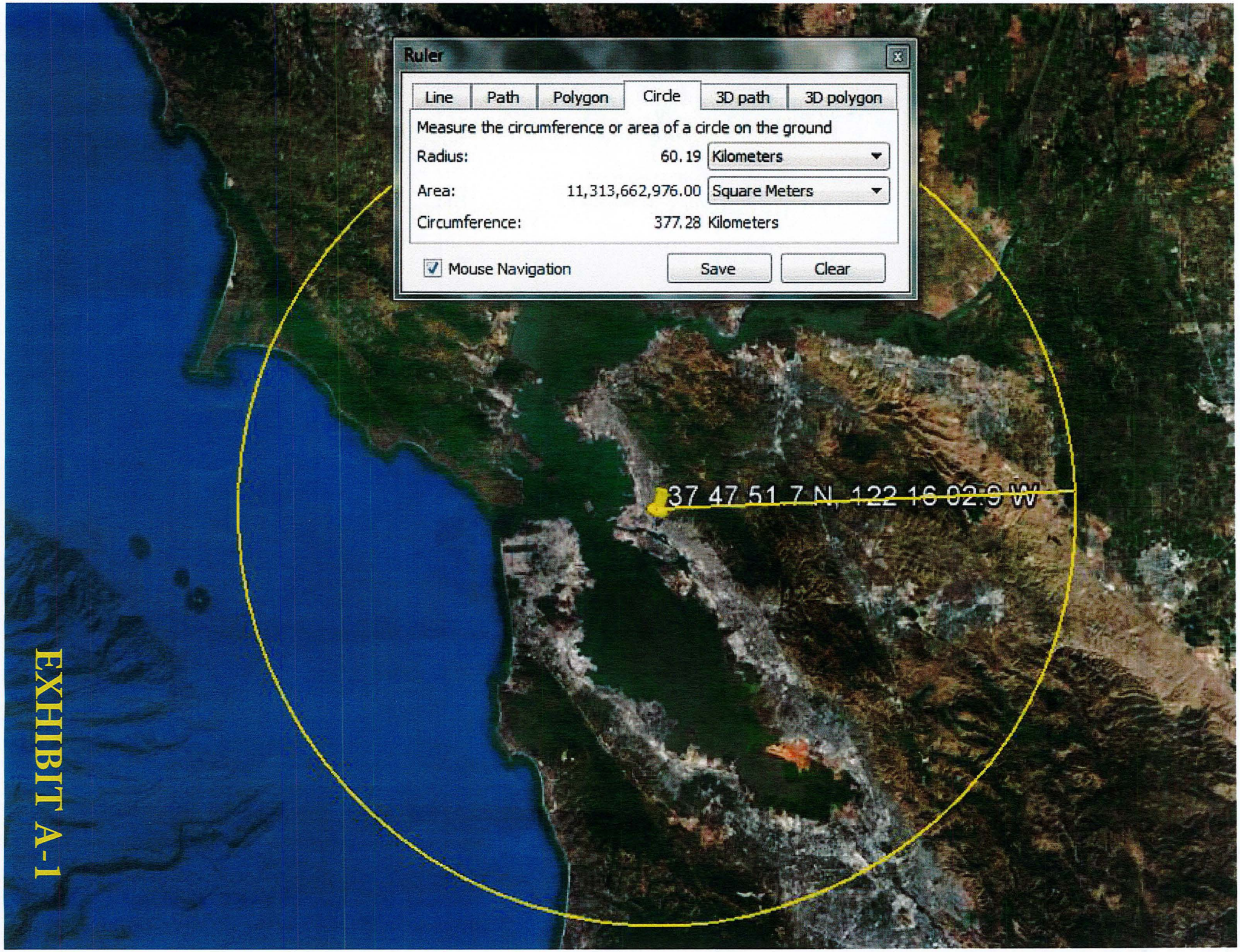
Ruler
Line
Path
Polygon
Circle
3D path
3D polygon
Measure the circumference or area of a circle on the ground
Radius: 60.19 Kilometers
Area: 11,313,662,976.00 Square Meters
Circumference: 377.28 Kilometers
Mouse Navigation
Save
Clear
37 47 51.7 N, 122 16 02.9 W

EXHIBIT A-1

BART SYSTEM: 2 Mile Radius Buffer

EXHIBIT A-2

Federal Communications Commission
Public Safety and Homeland Security Bureau

RADIO STATION AUTHORIZATION

LICENSEE: SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

ATTN: THOMAS HEROLD
SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT
300 LAKESIDE DR
OAKLAND, CA 94606

Call Sign	File Number
WQML952	0004394540
Radio Service PA - Public Safety 4940-4990 MHz Band	
Regulatory Status PMRS	
Frequency Coordination Number	

FCC Registration Number (FRN): 0001544063

Grant Date	Effective Date	Expiration Date	Print Date
09-21-2010	09-21-2010	09-21-2020	09-21-2010

STATION TECHNICAL SPECIFICATIONS

Fixed Location Address or Mobile Area of Operation

Loc. 1 **Area of operation**
Operating within a 60.0 km radius around 37-47-51.7 N, 122-16-02.9 W,
Oakland, ALAMEDA county, CA
Location 1 Special Condition
Except for those stations requiring an individual license under Rule 90.1207(b), this license authorizes temporary fixed stations anywhere within its authorized area.

Loc. 2 **Area of operation**
Operating within a 60.0 km radius around 37-47-51.7 N, 122-16-02.9 W,
Oakland, ALAMEDA county, CA
Location 2 Special Condition
Except for those stations requiring an individual license under Rule 90.1207(b), this license authorizes mobile and base stations anywhere within its authorized area.

Antennas

Loc No.	Ant No.	Frequencies (MHz)	Sta. Cls.	No. Units	No. Pagers	Emission Designator	Output Power (watts)	ERP (watts)	Ant. Ht./Tp meters	Ant. AAT meters	Construct Deadline Date
1	1	004940.00000000-004990.00000000									

Conditions:
Pursuant to §309(h) of the Communications Act of 1934, as amended, 47 U.S.C. §309(h), this license is subject to the following conditions: This license shall not vest in the licensee any right to operate the station nor any right in the use of the frequencies designated in the license beyond the term thereof nor in any other manner than authorized herein. Neither the license nor the right granted thereunder shall be assigned or otherwise transferred in violation of the Communications Act of 1934, as amended. See 47 U.S.C. § 310(d). This license is subject in terms to the right of use or control conferred by §706 of the Communications Act of 1934, as amended. See 47 U.S.C. §606.

FCC 601-ULSHS1
August 2007

EXHIBIT B

Licensee Name: SAN FRANCISCO BAY AREA RAPID

Call Sign: WQML952 **File Number:** 0004394540 **Print Date:** 09-21-2010

Antennas

Loc No.	Ant No.	Frequencies (MHz)	Sta. Cls.	No. Units	No. Pagers	Emission Designator	Output Power (watts)	ERP (watts)	Ant. Ht./Tp meters	Ant. AAT meters	Construct Deadline Date
2	1	004940.00000000-004990.00000000									

Control Points

Control Pt. No. 1

Address: 800 Madison Street

City: Oakland **County:** ALAMEDA **State:** CA **Telephone Number:** (510)464-7210

Associated Call Signs

<NA>

Waivers/Conditions:

This license gives the licensee authority to operate on any authorized channel in the 4940-4990 MHz band only within its legal jurisdiction, or in the case of a non-governmental organization, the legal jurisdiction of the state or local government entity supporting the non-government organization.

Antenna structures for land, base and fixed stations authorized for operation at temporary unspecified locations may be erected without specific prior approval of the Commission where such antenna structures do not exceed a height of 60.96 meters (200 feet) above ground level; provided that the overall height of such antennas more than 6.10 meters (20 feet) above ground, including their supporting structures (whether natural formation or man-made), do not exceed any of the slope ratios set forth in Section 17.7(b). Any antenna to be erected in excess of the foregoing limitations requires prior Commission approval. Licensees seeking such approval should file application for modification of license. In addition, notification to the Federal Aviation Administration is required whenever the antenna will exceed 60.96 meters (200 feet) above the ground and whenever notification is otherwise required by Section 17.7 of the Commission's Rules. Such notification should be given by filing FAA Form 7460-1, Notice of Proposed Construction or Alteration, in duplicate, with the nearest office of the Federal Aviation Administration, which form is available from that office.

Base or Temporary Fixed stations that meet Rule 90.1207(b) must apply for a separate authorization.